

A higher rate is shown for diphtheria and croup in 1919 than in 1918 for the registration area and for 22 of the 30 states which have comparable rates for these two years. The highest rates among the states are for Pennsylvania (21.4), Michigan (20.8), New York and Rhode Island (each 20), Connecticut (18.9), and New Jersey (18.5). Very low rates are shown for Vermont (4), Florida (5.8), Louisiana (6.4), Maine (6.5), and Oregon (6.6).

Among the cities of 100,000 population or more in 1910, the highest rates in 1919 are for Buffalo (59.2), Jersey City (33.7), St. Paul and St. Louis (each 33.4), Providence (32.5), and Detroit (32). Of these six cities the rates for Buffalo, Jersey City, and St. Paul are higher in 1919 than in any earlier year of the series 1911 to 1919. The cities with strikingly low rates are Spokane (1.9), Columbus (3), New Orleans (4.4), and Cambridge (4.6); with the exception of Spokane these cities also show lower rates in 1919 than in any earlier year shown in the table.

INFLUENZA AND PNEUMONIA (ALL FORMS).

In the latter part of 1918 a pandemic of influenza swept over the country and did not fully spend its force until well into 1919.

In studying the effects of the pandemic of influenza it is not believed to be best to study separately influenza and the various forms of pneumonia, bronchitis, and the respiratory diseases, for doubtless many cases were returned as influenza when the deaths were caused by pneumonia, and vice versa. The best method, therefore, seems to be to study as one group deaths from influenza and pneumonia (all forms), disregarding deaths from the other respiratory diseases, which were comparatively few. In fact, it is very remarkable how little difference it makes whether the pandemic mortality is measured by the excess mortality from influenza and pneumonia (all forms) or by the excess mortality from influenza and diseases of the respiratory system. In the former case the excess rate in 1918 in the registration area (exclusive of Hawaii) was 416.2 per 100,000, in the latter 415.9. To permit, however, a separate study of influenza and pneumonia (all forms) in 1919, separate figures are given in the report.

In the registration area (exclusive of Hawaii) the 189,326 deaths from influenza and pneumonia (all forms) in 1919 correspond to a rate of 222.4 per 100,000 population as against 479,038¹ deaths in 1918, with a rate of 588.7. Fully 79.8 per cent of the mortality from these causes in 1918 occurred in the last four months of the year, and as the pandemic continued into 1919, fully 83.2 per cent of the mortality from these causes in 1919 occurred in the first six months of the year.

¹ Includes the "additional deaths" from these causes given in the 1918 report.

Attention is called to the fact that the following table does not present annual rates per 100,000 population, but rates per 1,000 population for shorter intervals of time, i. e., for periods of eight months, six months, and four months. The figures thus presented may be readily combined into rates for the ten-month period of the epidemic. The areas shown are the registration states of 1915 (exclusive of the District of Columbia and North Carolina) and the cities of 100,000 population or more in 1910.

AREA.	Deaths from influenza and pneumonia (all forms), 1919.	DEATHS FROM INFLUENZA AND PNEUMONIA (ALL FORMS) PER 1,000 POPULATION.								
		1919			1918			1917	1916	1915
		Total.	First 6 months.	Last 6 months.	Total.	First 8 months.	Last 4 months.			
Registration states ¹	143,548	2.2	1.8	0.4	6.0	1.2	4.8	1.7	1.7	1.5
California	7,240	2.1	1.8	0.4	5.4	0.8	4.6	1.2	1.1	1.0
Colorado	2,364	2.5	2.1	0.4	7.7	1.3	6.3	1.5	1.2	1.7
Connecticut	3,089	2.2	1.8	0.4	7.7	1.5	6.2	2.2	2.3	1.7
Indiana	6,238	2.1	1.8	0.3	4.1	1.0	3.0	1.5	1.4	1.3
Kansas	3,319	1.9	1.6	0.3	4.7	1.0	3.7	1.4	1.3	1.2
Kentucky	6,861	2.8	2.5	0.4	5.4	1.0	4.4	1.4	1.5	1.2
Maine	1,757	2.3	1.8	0.5	5.9	1.4	4.5	1.9	1.9	1.7
Maryland	3,437	2.4	2.0	0.4	8.0	1.4	6.6	2.1	2.1	1.7
Massachusetts	7,956	2.1	1.7	0.4	7.3	1.3	5.9	1.8	1.9	1.7
Michigan	6,968	1.9	1.6	0.3	3.9	1.0	2.9	1.4	1.4	1.2
Minnesota	3,957	1.7	1.4	0.3	3.9	0.7	3.2	1.1	1.1	1.0
Missouri	7,003	2.1	1.7	0.4	4.8	1.2	3.6	1.8	1.7	1.4
Montana	1,217	2.3	2.0	0.3	7.8	1.1	6.6	1.5	1.2	1.2
New Hampshire	1,025	2.3	1.9	0.4	7.5	1.3	6.3	1.9	1.8	1.5
New Jersey	7,074	2.3	1.9	0.4	7.7	1.5	6.2	1.9	2.0	1.6
New York	24,111	2.3	1.9	0.4	6.0	1.4	4.6	1.9	1.9	1.8
Ohio	12,670	2.2	1.9	0.3	4.9	1.0	3.9	1.6	1.6	1.4
Pennsylvania	20,494	2.4	1.9	0.5	8.8	1.8	7.3	2.1	2.0	1.7
Rhode Island	1,438	2.4	2.0	0.4	6.8	1.4	5.4	2.1	2.0	1.8
Utah	1,206	2.7	2.3	0.4	6.1	1.0	4.1	1.2	1.3	1.2
Vermont	897	2.3	1.8	0.4	6.0	1.2	4.7	2.0	2.1	1.5
Virginia	6,136	2.7	2.3	0.3	6.2	1.1	5.2	1.4	1.5	1.3
Washington	2,529	1.9	1.5	0.4	4.1	0.7	3.4	0.8	0.8	0.8
Wisconsin	4,672	1.8	1.5	0.3	4.1	0.8	3.3	1.4	1.4	1.2
Registration cities of 100,000 population or more in 1910	59,779	2.4	2.0	0.4	6.4	1.5	4.9	2.0	1.8	1.8
Birmingham, Ala.	566	3.2	2.4	0.8	8.5	2.7	5.7	3.4	1.6	1.6
Los Angeles, Calif.	1,055	1.9	1.6	0.3	4.9	0.6	4.3	1.0	0.9	0.8
Oakland, Calif.	507	2.4	2.0	0.4	5.0	0.9	4.1	1.0	0.9	1.0
San Francisco, Calif.	1,422	2.8	2.4	0.4	6.5	1.0	5.4	1.2	1.3	1.3
Denver, Colo.	581	2.3	1.8	0.5	7.3	1.4	5.8	1.3	1.4	1.8
Bridgeport, Conn.	385	2.7	2.4	0.3	8.3	1.9	6.3	3.0	3.6	2.1
New Haven, Conn.	342	2.1	1.6	0.5	7.7	1.7	6.0	2.4	2.6	2.1
Washington, D. C.	976	2.3	1.8	0.5	7.6	1.7	5.9	1.7	1.7	1.9
Atlanta, Ga.	578	2.9	2.4	0.5	4.8	1.8	3.0	1.7	1.7	1.7
Chicago, Ill.	5,122	1.9	1.5	0.4	5.2	1.1	4.1	2.1	1.7	1.7
Indianapolis, Ind.	747	2.4	2.1	0.3	4.6	1.3	3.3	1.5	1.6	1.5
Louisville, Ky.	839	3.6	3.1	0.5	10.1	2.0	8.1	2.1	1.8	1.6
New Orleans, La.	1,284	3.3	2.8	0.5	7.7	1.5	6.2	1.8	1.5	2.4
Baltimore, Md.	1,679	2.3	1.8	0.5	8.0	1.7	6.3	2.5	2.4	2.0
Boston, Mass.	1,909	2.6	2.1	0.5	8.4	1.7	6.7	2.2	2.3	2.1
Cambridge, Mass.	197	1.8	1.4	0.4	6.8	1.5	5.3	1.7	1.8	1.6
Fall River, Mass.	261	2.2	1.8	0.3	8.0	1.1	6.9	2.3	2.9	2.1
Lowell, Mass.	223	2.0	1.6	0.4	7.0	1.8	5.2	1.8	1.9	1.9
Worcester, Mass.	443	2.5	2.0	0.5	7.3	1.6	5.7	2.0	2.3	1.9
Detroit, Mich.	2,847	2.4	2.0	0.5	4.1	1.3	2.8	1.9	1.8	1.5
Grand Rapids, Mich.	128	0.9	0.7	0.2	2.8	0.7	2.1	0.9	0.8	1.0
Minneapolis, Minn.	638	1.7	1.3	0.4	3.9	1.0	2.9	1.3	1.3	1.2
St. Paul, Minn.	341	1.5	1.2	0.3	4.8	0.9	3.9	1.1	1.0	1.3
Kansas City, Mo.	965	3.0	2.4	0.6	7.2	1.7	5.5	2.0	1.4	1.8
St. Louis, Mo.	1,554	2.0	1.6	0.5	5.4	1.6	3.8	2.2	2.0	1.5
Omaha, Nebr.	364	1.9	1.5	0.5	6.6	1.1	5.5	2.1	1.8	1.5
Jersey City, N. J.	940	3.2	2.6	0.6	7.6	1.8	5.8	2.2	2.1	2.1
Newark, N. J.	877	2.1	1.8	0.3	6.3	1.6	5.2	1.8	1.9	1.5
Paterson, N. J.	319	2.4	2.0	0.4	6.8	1.2	5.6	1.9	2.3	1.6
Albany, N. Y.	276	2.4	2.0	0.5	6.8	1.2	5.6	1.9	1.9	1.8
Buffalo, N. Y.	1,086	2.1	1.7	0.4	6.4	1.4	5.0	1.9	1.7	1.7

(See footnotes at end of table.)

AREA.	Deaths from influenza and pneumonia (all forms), 1919.	DEATHS FROM INFLUENZA AND PNEUMONIA (ALL FORMS) PER 1,000 POPULATION.								
		1919			1918			1917	1916	1915
		Total.	First 6 months.	Last 6 months.	Total.	First 6 months.	Last 4 months.			
Registration cities of 100,000 population or more in 1910—Continued.										
New York, N. Y.	14,822	2.7	2.2	0.4	5.3	1.6	4.2	2.1	2.0	2.1
Bronx borough	1,730	2.4	2.1	0.3	5.5	1.2	4.2	1.7	1.5	1.9
Brooklyn borough	5,389	2.7	2.3	0.4	6.0	1.7	4.3	2.1	2.1	2.1
Manhattan borough	6,384	2.8	2.3	0.5	5.3	1.7	4.1	2.2	2.1	2.4
Queens borough	1,020	2.2	1.9	0.3	5.4	1.3	4.1	1.9	1.7	1.6
Richmond borough	339	3.0	2.5	0.5	7.8	1.7	6.0	1.9	1.9	1.9
Rochester, N. Y.	447	1.5	1.1	0.4	5.2	1.2	4.1	1.6	1.3	1.3
Syracuse, N. Y.	265	1.6	1.2	0.4	7.0	1.4	5.7	1.5	1.4	1.2
Cincinnati, Ohio	1,014	2.5	2.1	0.4	6.1	1.4	4.7	1.7	1.8	1.6
Cleveland, Ohio	2,046	2.6	2.2	0.4	5.9	1.2	4.7	2.0	1.9	1.5
Columbus, Ohio	500	2.1	1.7	0.4	4.5	1.1	3.4	1.7	1.3	1.4
Dayton, Ohio	233	1.5	1.2	0.3	5.2	1.0	4.2	1.5	1.5	1.4
Toledo, Ohio	436	1.8	1.6	0.3	4.0	0.9	3.1	1.5	1.6	1.3
Portland, Ore.	331	2.5	2.1	0.3	4.5	0.8	3.7	0.8	0.7	0.7
Philadelphia, Pa.	4,034	2.2	1.8	0.4	9.3	1.8	7.5	2.2	1.9	1.9
Pittsburgh, Pa.	2,524	4.3	3.5	0.8	12.4	3.2	9.2	3.8	3.7	2.6
Scranton, Pa.	340	2.5	1.9	0.6	9.9	2.2	7.7	2.4	2.3	2.2
Providence, R. I.	600	2.5	2.1	0.4	7.4	1.7	5.7	2.2	2.2	1.9
Memphis, Tenn.	510	3.4	2.7	0.7	6.7	1.8	4.9	2.2	(*)	1.8
Nashville, Tenn.	355	3.0	2.5	0.5	9.1	2.8	6.3	1.8	(*)	1.8
Richmond, Va.	489	2.7	2.1	0.6	6.6	1.3	5.3	2.0	2.1	2.1
Seattle, Wash.	591	1.9	1.5	0.4	4.3	0.7	3.5	0.5	0.6	0.8
Spokane, Wash.	220	2.1	1.7	0.4	4.9	0.8	4.1	1.0	0.8	0.9
Milwaukee, Wis.	351	1.9	1.4	0.5	4.7	1.2	3.5	1.9	1.8	1.6

NOTE.—The populations used in computing the rates are estimated by the arithmetical method, based on the 1910 and 1920 censuses. All death rates are based on the total deaths, including deaths of nonresidents, deaths in hospitals and institutions, and deaths of soldiers, sailors, and marines; those for 1918 also include the "additional deaths" given in the 1918 report.

* Registration states of 1915 (exclusive of District of Columbia and North Carolina).

* Exclusive of Memphis and Nashville, for which cities transcripts for deaths were not received.

* Transcripts for deaths not received.

The rates in the preceding table clearly show that the pandemic exacted a much greater toll in some parts of the country than in others, and that places showing the lowest rates for the last 4 months of 1918 as a rule showed the lowest rates for the first 6 months of 1919. Combining the rates for the last 4 months of 1918 with those for the first 6 months of 1919, it appears that in these 10 months, for states, the highest rates are for Pennsylvania (9.2), Maryland and Montana (each 8.6), and Colorado (8.4), while for the cities shown the highest rates are for Pittsburgh (12.7), Louisville (11.2), Scranton (9.6), and Philadelphia (9.3). On the other hand, for this 10-month period the lowest rates for states are for Michigan (4.5), Minnesota (4.6), and Indiana and Wisconsin (each 4.8), and for cities are for Grand Rapids (2.8), Minneapolis (4.2), Toledo (4.7), and Detroit (4.8).

Special attention is called to the low rates of Grand Rapids and the high rates of Pittsburgh. For both

1918 and 1919 Grand Rapids has the lowest rates from influenza and pneumonia (all forms), while Pittsburgh has the highest.

Michigan was not included in the registration area in 1890, the year of the previous influenza epidemic, but from the Michigan state report for that year it appears that Michigan had a pneumonia rate of 53.5 per 100,000 population, which was very much lower than the lowest rate for any state in the registration area, the lowest being 165.7 for New Hampshire.

Now that the new estimates of populations permit more accurate calculations of death rates for recent years, further attempts should be made to measure the correlation between the death rates from influenza and pneumonia (all forms) and the death rates from other causes. Correlating the combined pneumonia and influenza rates for the 10 months of the epidemic, as found in the preceding table, for each city (taking the rates for the boroughs of New York city separately and not the rate for New York city as a whole), with the corresponding rates from pneumonia (all forms) for 1917, Galton's coefficient of correlation is found to be .67 and the probable error $\pm .05$, while the coefficient of variation of the epidemic rates is .25 and of the 1917 pneumonia rates is .32.

Similar correlations for the epidemic rates from influenza and pneumonia (all forms) and the rates in 1917 from all causes of death, tuberculosis of the lungs and organic diseases of the heart show correlations, respectively, of $.60 \pm .06$, $.37 \pm .08$, $.36 \pm .08$. This coefficient of correlation .67 between rates from influenza and pneumonia (all forms) during the epidemic and rates from pneumonia (all forms) in a nonepidemic year certainly suggests the desirability of a most careful study of all factors involved. Is it not reasonable to hope, for example, that an intensive study of conditions in Grand Rapids as contrasted with conditions in Pittsburgh will make it possible to eliminate certain disturbing factors from our calculations and so lead to a much closer correlation between the rates of pneumonia in a normal year and the rates of pneumonia and influenza in the pandemic, perhaps for certain age groups, for certain occupations, or for certain race stocks?

The following table gives the deaths from influenza and pneumonia (all forms), by sex and age, in the registration area of 1918 and 1919, and also the distribution of these deaths by ages in each 1,000 shown.

NUMBER OF DEATHS FROM INFLUENZA AND PNEUMONIA (ALL FORMS), IN THE REGISTRATION AREA, BY SEX AND AGE, AND DISTRIBUTION PER 1,000, BY AGE OF DECEDENT: 1918 AND 1919.

AGE OF DECEDENT.	DEATHS IN THE REGISTRATION AREA ¹ FROM INFLUENZA AND PNEUMONIA (ALL FORMS).							
	Number.				Distribution per 1,000.			
	1919		1918		1919		1918	
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
All ages.....	98,905	90,421	272,508	208,530	1,000.0	1,000.0	1,000.0	1,000.0
Under 1 year.....	16,004	12,264	22,133	17,361	161.8	135.6	81.2	84.1
1 year.....	5,815	5,124	12,602	11,641	58.8	56.7	46.2	56.4
2 years.....	2,682	2,509	6,368	6,630	27.1	27.7	23.4	32.1
3 years.....	1,583	1,672	3,816	4,203	16.0	18.5	14.0	20.4
4 years.....	1,073	1,056	2,863	3,007	10.8	11.7	10.5	14.6
Under 5 years.....	27,157	22,626	47,782	42,842	274.5	250.2	175.3	207.6
5 to 9 years.....	2,979	3,185	7,748	8,447	30.1	34.7	28.4	40.9
10 to 14 years.....	2,098	2,597	7,075	7,075	21.2	28.7	20.9	34.3
15 to 19 years.....	4,718	4,047	15,913	12,234	47.7	44.8	58.4	59.2
20 to 24 years.....	5,473	6,618	29,469	28,110	55.3	73.2	108.1	111.9
25 to 29 years.....	7,708	9,199	39,958	30,082	78.5	101.7	148.6	145.4
30 to 34 years.....	8,455	7,513	37,408	22,994	85.6	83.1	137.3	111.3
35 to 39 years.....	7,558	5,278	26,030	14,261	74.4	58.4	95.5	69.1
40 to 44 years.....	5,132	3,472	14,827	7,852	51.9	38.4	54.4	38.0
45 to 49 years.....	4,561	3,000	10,994	5,869	46.1	33.2	40.4	28.4
50 to 54 years.....	3,953	2,873	7,604	5,094	40.0	31.8	27.9	24.7
55 to 59 years.....	3,439	2,813	6,101	4,345	34.8	31.1	22.4	21.0
60 to 64 years.....	3,559	2,941	5,575	4,228	36.0	32.5	20.5	20.5
65 to 69 years.....	3,428	3,329	4,067	4,367	34.6	36.8	18.2	21.1
70 to 74 years.....	3,106	3,400	4,332	4,427	31.4	37.6	15.9	21.4
75 to 79 years.....	2,547	3,130	3,264	3,885	25.8	34.6	12.0	18.8
80 to 84 years.....	1,671	2,344	2,147	2,797	16.9	25.9	7.9	18.5
85 to 89 years.....	907	1,330	1,076	1,493	9.2	14.7	3.9	7.2
90 to 94 years.....	303	448	360	554	3.1	5.0	1.3	2.7
95 to 99 years.....	65	120	73	134	0.6	1.3	0.3	0.6
100 years and over.....	19	33	21	56	0.2	0.4	0.1	0.3
Unknown.....	219	178	1,185	434	2.2	1.9	4.3	2.1

¹ Exclusive of Hawaii.

The same high distribution of deaths under 5 years and between 20 and 40 years is shown in both the

1918 and 1919 periods, although much more marked in 1918, clearly showing that the latter part of the epidemic was not essentially different from the first in this respect.

Requests have been received by the Bureau of the Census for the number of deaths caused by the 1918-19 influenza pandemic in the United States. Obviously it is not possible to give entirely satisfactory figures. The death registration area, exclusive of Hawaii, in 1918 contained only 78.6 per cent of the population of the United States and 81 per cent in 1919; certification of causes of death can never be more perfect than the diagnostic powers of the attending physicians; and the assignment of joint causes of death to a single cause is necessarily unsatisfactory. However, to give a measure of the ravages of the pandemic, the following table has been prepared for the registration states of 1915 showing in the first two columns the number of deaths from influenza and pneumonia (all forms) which would have occurred September 1, 1918, to June 30, 1919, had the 1915 death rates from these causes for corresponding months prevailed, and in addition showing the actual deaths in the pandemic period from these causes, the excess deaths from these causes, and excess death rates.

If the assumption is made that the excess death rates given below for the registration states of 1915, held for the rest of the United States, then the toll of the pandemic in the United States (exclusive of Hawaii) may be estimated as approximately 548,452 deaths.

AREA.	ESTIMATED ¹ NORMAL NUMBER OF DEATHS FROM INFLUENZA AND PNEUMONIA (ALL FORMS).		ACTUAL DEATHS FROM INFLUENZA AND PNEUMONIA (ALL FORMS).		EXCESS DEATHS FROM INFLUENZA AND PNEUMONIA (ALL FORMS).			EXCESS DEATH RATE FROM INFLUENZA AND PNEUMONIA (ALL FORMS) PER 100,000 POPULATION.		Sum of figures in the two preceding columns.
	Last 4 months of 1918.	First 6 months of 1919.	Last 4 months of 1918.	First 6 months of 1919.	Last 4 months of 1918.	First 6 months of 1919.	Total for 10 months, September, 1918, to June, 1919.	Last 4 months of 1918.	First 6 months of 1919.	
Registration states ² as of 1915.....	27,763	62,266	309,920	119,939	282,157	57,673	339,830	439.8	88.6	528.4
California.....	1,470	1,622	14,951	6,021	13,481	4,399	17,880	412.9	130.4	543.3
Colorado.....	580	987	5,806	1,975	5,223	1,088	6,266	569.6	111.3	680.9
Connecticut.....	593	1,588	8,324	2,510	7,731	822	5,653	577.1	67.5	644.6
Indiana.....	882	2,676	8,809	5,311	7,927	2,035	10,562	273.8	90.3	364.1
Kansas.....	729	1,268	6,565	2,872	6,386	1,604	7,440	332.1	90.9	423.0
Kentucky.....	755	1,960	10,571	6,014	9,316	4,054	13,870	409.5	168.2	577.7
Maine.....	256	955	3,474	1,404	3,218	449	3,667	421.2	58.6	479.8
Maryland.....	644	1,680	9,405	2,817	8,761	1,137	9,898	614.5	78.9	693.4
Massachusetts.....	1,776	4,313	22,383	6,487	20,607	2,169	22,776	545.6	56.7	602.3
Michigan.....	1,113	2,711	10,808	5,774	9,190	3,063	12,253	259.9	84.5	344.4
Minnesota.....	756	1,486	7,438	3,286	6,682	1,800	8,482	286.7	75.9	361.6
Missouri.....	1,593	3,149	12,250	5,694	10,657	2,545	13,202	314.6	74.9	389.5
Montana.....	235	363	3,465	1,051	3,230	688	3,913	618.6	127.4	746.0
New Hampshire.....	158	488	2,783	855	2,605	367	2,972	590.5	82.9	673.4
New Jersey.....	1,570	3,187	18,842	5,390	17,272	2,662	19,924	564.4	84.8	649.3
New York.....	5,226	12,475	46,675	19,971	41,459	7,496	48,945	400.8	72.6	473.4
Ohio.....	2,031	5,258	21,828	10,736	19,797	5,478	25,275	383.1	96.0	479.1
Pennsylvania.....	4,554	9,287	62,193	16,485	57,639	7,198	64,837	673.6	83.1	756.7
Rhode Island.....	263	809	3,210	1,189	2,948	380	3,328	485.6	63.2	548.8
Utah.....	207	294	1,800	1,044	1,593	750	2,343	364.0	163.4	527.4
Vermont.....	102	407	1,676	648	1,574	242	1,816	445.9	69.6	515.5
Virginia.....	730	2,159	11,696	5,368	10,966	3,218	14,134	482.9	140.1	623.0
Washington.....	401	611	4,558	2,013	4,157	1,402	5,559	314.1	104.2	418.3
Wisconsin.....	926	2,026	8,459	3,806	7,533	1,780	9,313	291.3	69.0	360.3

(See footnotes at end of table.)

CAUSES OF DEATH.

31

AREA.	ESTIMATED ¹ NORMAL NUMBER OF DEATHS FROM INFLUENZA AND PNEUMONIA (ALL FORMS).		ACTUAL DEATHS FROM INFLUENZA AND PNEUMONIA (ALL FORMS).		EXCESS DEATHS FROM INFLUENZA AND PNEUMONIA (ALL FORMS).			EXCESS DEATH RATE FROM IN- FLUENZA AND PNEUMONIA (ALL FORMS) PER 100,000 POPULA- TION.		Sum of figures in the two preceding columns.
	Last 4 months of 1918.	First 6 months of 1919.	Last 4 months of 1918.	First 6 months of 1919.	Last 4 months of 1918.	First 6 months of 1919.	Total for 10 months, September, 1918, to June, 1919.	Last 4 months of 1918.	First 6 months of 1919.	
CITIES OF 100,000 POPULATION OR MORE IN 1910.										
Birmingham, Ala.	83	187	987	427	904	240	1,144	525.5	135.7	661.2
Los Angeles, Calif.	185	238	2,299	908	2,104	670	2,774	589.6	118.9	508.5
Oakland, Calif.	80	114	845	426	765	312	1,077	371.1	146.5	517.6
San Francisco, Calif.	237	331	2,675	1,218	2,438	887	3,325	493.3	176.1	669.4
Denver, Colo.	198	244	1,460	449	1,262	205	1,467	605.4	80.7	586.1
Bridgeport, Conn.	88	185	868	336	780	151	931	570.2	107.1	677.3
New Haven, Conn.	97	216	948	265	851	49	900	538.8	30.5	569.3
Washington, D. C.	209	561	2,469	768	2,260	207	2,467	556.7	47.9	584.6
Atlanta, Ga.	80	224	875	479	495	255	750	255.5	128.6	384.1
Chicago, Ill.	1,566	2,751	10,755	4,021	9,189	1,270	10,459	350.4	47.5	397.9
Indianapolis, Ind.	145	296	990	642	845	346	1,191	278.7	111.4	390.1
Louisville, Ky.	89	248	1,894	731	1,805	483	2,288	772.4	206.0	978.4
New Orleans, La.	308	566	2,363	1,089	2,055	523	2,578	540.9	135.9	676.8
Baltimore, Md.	368	949	4,038	1,284	3,720	335	4,055	870.7	46.0	616.7
Boston, Mass.	499	982	4,859	1,549	4,460	597	5,057	604.0	80.2	684.2
Cambridge, Mass.	59	88	575	154	516	66	582	474.5	51.3	525.8
Fall River, Mass.	49	180	891	222	782	32	814	650.0	26.6	676.6
Lowell, Mass.	50	155	575	181	525	26	551	470.8	23.2	494.0
Worcester, Mass.	88	222	984	355	906	133	1,039	519.1	74.7	593.8
Detroit, Mich.	538	789	2,585	1,899	2,048	1,110	3,158	223.7	114.7	338.4
Grand Rapids, Mich.	30	98	280	99	250	1	251	186.6	0.7	187.2
Minneapolis, Minn.	199	228	1,053	800	859	272	1,131	238.2	72.3	305.5
St. Paul, Minn.	112	170	908	272	796	102	898	343.8	43.7	387.5
Kansas City, Mo.	217	317	1,724	772	1,507	455	1,962	432.0	142.0	624.0
St. Louis, Mo.	416	729	2,883	1,109	2,467	470	2,937	324.8	61.2	386.0
Omaha, Nebr.	117	148	1,030	278	913	130	1,043	490.5	68.5	559.0
Jersey City, N. J.	197	374	1,695	769	1,498	395	1,893	510.9	133.3	644.2
Newark, N. J.	171	387	2,106	735	1,834	348	2,282	478.8	84.7	563.5
Paterson, N. J.	77	121	761	269	674	148	822	501.9	109.4	611.3
Albany, N. Y.	49	153	623	225	574	72	646	514.3	63.8	578.1
Buffalo, N. Y.	250	533	2,474	867	2,224	324	2,548	451.0	64.6	515.6
New York, N. Y.	3,371	7,398	23,265	12,437	19,894	5,049	24,943	362.4	90.5	452.9
Bronx borough.	377	824	2,599	1,483	2,522	659	3,181	367.9	92.0	459.9
Brooklyn borough.	1,197	2,670	8,497	4,585	7,300	1,865	9,165	372.0	98.1	469.1
Manhattan borough.	1,523	3,298	9,418	5,260	7,835	1,962	9,897	344.5	85.8	430.3
Queens borough.	218	461	1,778	877	1,590	416	1,976	355.7	91.0	446.7
Richmond borough.	86	135	673	282	617	147	764	554.2	128.5	682.7
Rochester, N. Y.	85	248	1,125	333	1,040	85	1,125	376.7	29.0	405.7
Syracuse, N. Y.	64	131	943	203	879	72	951	528.2	42.4	570.6
Cincinnati, Ohio.	192	428	1,867	849	1,675	420	2,095	419.8	104.9	524.7
Cleveland, Ohio.	420	700	3,576	1,733	3,156	1,033	4,189	413.9	131.5	545.4
Columbus, Ohio.	98	207	781	408	685	201	886	299.6	85.8	385.4
Dayton, Ohio.	60	146	617	138	567	42	599	376.2	27.6	403.8
Toledo, Ohio.	107	176	716	375	609	200	809	261.8	83.5	345.3
Portland, Oreg.	53	111	920	544	867	438	1,300	344.4	169.1	513.5
Philadelphia, Pa.	1,897	1,852	18,428	8,287	12,029	1,885	13,914	675.5	76.6	752.1
Pittsburgh, Pa.	523	890	5,840	2,028	4,817	1,138	5,955	831.9	194.7	1,026.6
Scranton, Pa.	71	207	1,050	255	879	48	1,027	716.9	34.9	751.8
Providence, R. I.	101	380	1,943	504	1,242	174	1,416	527.3	73.4	600.7
Memphis, Tenn.	98	158	724	399	631	241	872	427.1	160.9	588.0
Nashville, Tenn.	68	134	742	284	674	100	834	570.0	135.7	712.3
Richmond, Va.	103	238	886	354	783	116	899	467.1	68.1	535.2
Seattle, Wash.	73	149	1,071	460	998	311	1,309	328.6	99.8	428.4
Spokane, Wash.	43	49	430	175	387	126	513	371.3	120.9	492.2
Milwaukee, Wis.	272	402	1,562	641	1,290	239	1,529	289.8	52.7	342.0

¹ Estimate based on the corresponding death rates for 1915, which are assumed to represent normal rates.
² Excluding North Carolina and including the District of Columbia.

INFLUENZA.

The number of deaths from influenza in 1919 is 84,113, corresponding to a rate of 98.8 per 100,000 population, as against 245,846 deaths in 1918 and a rate of 302.1. The number given for 1918 includes the "additional deaths" shown in the 1918 report.

The following table shows the rates per 100,000 population for the years 1911 to 1919 and the annual average for the five-year period 1906 to 1910, rates of 40 and higher being printed in bold-faced type:

AREA.	DEATH RATE FROM INFLUENZA PER 100,000 POPULATION.										
	[Rates of 40 or more in bold-faced type.]										
	1919	1918	1917	1916	1915	1914	1913	1912	1911	Annual average, 1906 to 1910	
SUMMARY.											
The registration area ¹	98.8	302.1	17.3	26.5	16.0	9.1	12.2	10.3	15.7	16.4	
Registration states ²	98.5	301.3	17.5	27.2	15.9	9.0	12.4	10.2	15.8	16.5	
Registration cities in non-registration states	114.1	338.0	14.2	16.2	18.4	10.8	10.3	12.9	14.3	15.7	
REGISTRATION STATES.											
California.....	116.8	309.9	9.0	13.4	8.1	4.8	10.1	8.2	8.4	9.7	
Colorado.....	129.2	355.7	15.8	14.2	14.9	5.6	5.7	7.2	12.5	13.7	
Connecticut.....	80.3	423.5	24.4	37.5	18.0	13.6	16.4	14.5	23.3	26.0	
Delaware.....	104.6	(³)	(³)	(³)	(³)	(³)	(³)	(³)	(³)	(³)	
Florida.....	92.1	(³)	(³)	(³)	(³)	(³)	(³)	(³)	(³)	(³)	
Illinois.....	80.6	258.1	(³)	(³)	(³)	(³)	(³)	(³)	(³)	(³)	
Indiana.....	103.6	193.1	21.1	34.0	16.9	9.3	14.2	14.5	18.3	20.3	
Kansas.....	101.1	251.6	31.0	41.3	26.7	9.8	(³)	(³)	(³)	(³)	
Kentucky.....	160.3	328.3	24.5	41.6	19.7	14.8	16.9	16.7	17.8	(³)	
Louisiana.....	119.6	315.5	(³)	(³)	(³)	(³)	(³)	(³)	(³)	(³)	
Maine.....	105.3	334.8	30.9	49.8	25.7	12.2	23.0	11.5	25.3	24.3	
Maryland.....	85.5	352.5	16.7	25.2	14.8	10.9	14.4	12.1	16.5	20.5	
Massachusetts.....	73.9	342.0	12.6	18.5	8.6	6.0	9.3	7.0	10.1	15.9	
Michigan.....	83.5	191.3	15.5	27.9	16.1	9.5	11.0	10.1	18.0	17.5	
Minnesota.....	88.0	250.3	9.5	18.2	10.6	4.8	8.5	3.4	8.4	(³)	
Mississippi.....	168.5	(³)	(³)	(³)	(³)	(³)	(³)	(³)	(³)	(³)	
Missouri.....	77.5	212.3	24.1	35.5	21.5	10.4	17.1	16.2	26.0	(³)	
Montana.....	127.5	521.6	8.5	11.9	8.8	4.9	6.9	4.1	3.8	(³)	
New Hampshire.....	111.4	457.4	33.0	35.3	29.0	17.2	16.6	13.9	26.6	27.1	
New Jersey.....	87.8	303.1	13.9	23.4	11.0	7.3	8.9	7.2	11.3	9.7	
New York.....	67.3	224.7	14.9	19.9	13.3	8.1	11.1	8.1	14.6	15.1	
North Carolina.....	149.3	324.6	16.3	25.1	18.9	18.4	18.0	20.5	24.2	(³)	
Ohio.....	89.3	258.8	17.5	30.2	18.5	10.0	13.9	11.4	21.6	(³)	
Oregon.....	109.2	209.8	(³)	(³)	(³)	(³)	(³)	(³)	(³)	(³)	
Pennsylvania.....	79.4	454.7	17.8	30.8	17.8	9.4	12.4	10.1	14.7	17.9	
Rhode Island.....	94.5	368.5	21.4	28.0	13.2	8.6	13.3	8.1	9.6	19.1	
South Carolina.....	189.3	381.0	18.5	25.7	(³)	(³)	(³)	(³)	(³)	(³)	
Tennessee.....	132.8	372.5	24.6	(³)	(³)	(³)	(³)	(³)	(³)	(³)	
Utah.....	180.2	326.7	10.5	15.6	18.0	6.4	11.3	7.2	6.5	(³)	
Vermont.....	103.8	395.5	43.0	78.9	32.5	20.0	35.8	23.9	44.2	39.2	
Virginia.....	168.2	420.2	20.7	32.9	18.7	12.0	13.3	(³)	(³)	(³)	
Washington.....	101.5	240.9	9.1	17.1	11.6	4.4	7.3	5.0	9.4	(³)	
Wisconsin.....	84.3	244.6	15.3	29.6	15.6	7.0	11.1	8.6	12.8	(³)	
REGISTRATION CITIES OF 100,000 POPULATION OR MORE IN 1910.											
Birmingham, Ala.....	125.5	359.3	29.9	14.8	22.2	11.8	8.8	21.6	8.7	(³)	
Los Angeles, Calif.....	113.0	290.9	5.8	9.6	4.5	3.5	9.5	7.3	6.3	9.1	
Oakland, Calif.....	109.9	174.2	6.5	8.8	2.7	2.8	5.2	1.8	3.8	5.0	
San Francisco, Calif.....	151.5	367.5	2.7	4.0	2.1	2.4	4.7	2.5	2.8	4.8	
Denver, Colo.....	77.9	315.5	13.5	11.2	11.4	3.0	2.6	7.2	7.3	12.1	
Bridgeport, Conn.....	115.6	347.9	12.1	19.5	11.3	5.8	6.9	7.2	12.1	10.8	
New Haven, Conn.....	87.0	442.6	11.0	36.8	12.1	6.2	11.2	7.1	21.1	20.0	
Washington, D. C.....	76.6	371.2	21.0	22.0	26.5	16.7	12.3	17.2	19.7	25.3	
Atlanta, Ga.....	143.2	174.4	11.6	15.2	20.0	17.7	19.9	18.8	11.8	30.4	
Chicago, Ill.....	56.6	213.8	6.0	11.6	9.3	3.9	4.3	6.4	8.0	9.8	
Indianapolis, Ind.....	89.2	135.2	12.5	16.8	8.8	5.6	9.3	6.8	9.5	16.7	
Louisville, Ky.....	105.8	462.6	15.0	34.0	16.0	20.4	14.8	15.4	13.9	15.1	
New Orleans, La.....	149.1	328.7	29.9	27.0	61.8	31.7	19.7	26.0	26.7	32.3	
Baltimore, Md.....	56.3	259.6	16.7	20.2	11.7	8.4	8.7	11.5	12.9	16.6	
Boston, Mass.....	94.8	350.5	4.9	11.7	4.4	3.4	5.4	4.0	4.7	2.5	

DEATH RATE FROM INFLUENZA PER 100,000 POPULATION.

[Rates of 40 or more in bold-faced type.]

AREA.	1919	1918	1917	1916	1915	1914	1913	1912	1911	Annual average, 1906 to 1910
REGISTRATION CITIES OF 100,000 POPULATION OR MORE IN 1910—contd.										
Cambridge, Mass.	49.4	282.3	7.4	10.2	5.6	5.6	10.3	4.7	7.6	11.6
Fall River, Mass.	81.4	489.7	9.2	25.8	1.7	4.2	7.5	2.5	1.7	10.8
Lowell, Mass.	62.4	259.1	2.7	14.5	3.6	2.8	3.7	5.6	3.7	11.3
Worcester, Mass.	75.3	263.0	7.0	14.9	6.7	2.5	4.5	5.9	6.0	7.9
Detroit, Mich.	85.7	152.3	4.3	7.6	6.6	2.9	4.0	2.6	3.8	5.9
Grand Rapids, Mich.	22.0	129.0	1.5	9.4	4.0	5.7	3.3	2.5	4.3	8.6
Minneapolis, Minn.	77.8	213.2	5.8	9.1	6.7	4.2	5.2	2.2	2.2	4.4
St. Paul, Minn.	59.9	297.6	8.3	10.1	8.9	4.9	5.0	4.1	5.5	3.7
Kansas City, Mo.	93.9	263.4	12.1	15.8	19.4	7.1	9.9	7.5	22.5	12.6
St. Louis, Mo.	89.6	178.0	22.1	23.3	12.1	9.5	12.6	14.7	16.2	15.4
Omaha, Nebr.	49.5	348.7	9.3	17.8	13.5	7.9	5.2	6.1	7.8	14.1
Jersey City, N. J.	94.8	219.3	11.7	14.6	6.7	3.9	4.3	2.5	5.9	6.6
Newark, N. J.	45.5	185.9	10.8	18.2	6.3	5.8	7.0	4.4	9.3	8.5
Paterson, N. J.	95.3	350.7	3.8	19.7	6.1	3.8	9.3	9.7	10.2	5.5
Albany, N. Y.	81.6	342.2	17.2	34.8	23.5	13.3	19.2	15.5	25.6	22.5
Buffalo, N. Y.	61.8	259.9	7.6	10.1	6.4	2.4	4.7	3.8	5.5	10.4
New York, N. Y.	66.0	157.5	8.4	10.3	7.5	4.4	5.6	4.1	7.0	7.9
Bronx borough	62.2	158.3	6.7	9.3	6.1	5.7	6.6	4.2	6.8	6.3
Brooklyn borough	67.8	156.2	9.5	12.7	9.2	6.8	7.0	5.2	9.1	9.9
Manhattan borough	68.1	154.9	8.8	8.6	6.5	3.8	4.3	3.5	5.5	6.8
Queens borough	52.0	164.4	5.5	10.7	8.9	4.4	4.6	2.5	5.9	6.4
Richmond borough	74.3	201.2	2.8	10.5	5.9	2.0	6.3	3.2	14.5	10.6
Rochester, N. Y.	36.9	223.2	5.2	8.7	5.9	6.0	3.4	4.7	5.8	8.8
Syracuse, N. Y.	23.0	268.0	4.9	10.7	3.8	4.6	4.7	4.8	4.2	9.6
Cincinnati, Ohio	131.1	311.8	18.1	27.9	10.0	16.3	13.8	13.3	14.6	24.0
Cleveland, Ohio	87.3	354.4	11.4	15.4	10.6	3.9	3.9	4.7	10.5	9.2
Columbus, Ohio	94.4	195.1	11.2	33.1	10.9	7.8	8.5	6.2	14.3	9.3
Dayton, Ohio	54.0	237.0	11.1	17.1	13.2	3.0	8.5	3.2	14.0	12.2
Toledo, Ohio	79.3	206.4	10.6	17.8	15.6	4.0	9.9	6.5	14.1	16.2
Portland, Oreg.	133.3	286.6	6.9	13.6	6.0	5.7	6.8	3.2	8.9	8.9
Philadelphia, Pa.	46.6	408.8	14.2	23.8	20.4	9.7	9.0	7.9	11.6	14.4
Pittsburgh, Pa.	101.0	345.3	16.3	27.1	10.7	6.3	8.5	10.1	11.8	18.4
Scranton, Pa.	72.8	519.2	8.1	19.3	9.7	5.3	8.3	5.3	11.5	13.7
Providence, R. I.	112.7	289.7	16.7	25.3	11.2	7.0	9.2	5.7	7.5	16.3
Memphis, Tenn.	120.2	293.1	21.3	(³)	38.1	18.6	24.0	28.5	26.2	33.6
Nashville, Tenn.	128.9	418.3	24.1	(³)	25.3	22.0	17.7	36.2	35.9	41.2
Richmond, Va.	115.7	343.9	17.6	19.7	16.3	18.0	16.1	18.7	17.6	29.0
Seattle, Wash.	98.2	251.9	4.7	12.5	7.5	1.8	5.3	3.1	6.9	4.1
Spokane, Wash.	93.1	270.5	13.4	17.3	17.3	3.8	6.7	7.7	9.6	8.6
Milwaukee, Wis.	45.2	211.5	9.8	16.0	16.5	3.6	6.2	4.8	3.3	8.3

NOTE.—For the years 1911 to 1919 the populations used in computing the rates are estimated by the arithmetical method, based on the 1910 and 1920 censuses. All death rates are based on the total deaths, including deaths of nonresidents, deaths in hospitals and institutions, and deaths of soldiers, sailors, and marines; those for 1918 also include the "additional deaths" given in the 1918 report.

- ¹ Exclusive of Hawaii.
- ² Including the District of Columbia.
- ³ Not added to registration area until a later date.
- ⁴ Figures for deaths not available for the entire period.
- ⁵ Includes only municipalities having a population of 1,000 or more in 1910.
- ⁶ Includes only municipalities having a population of 1,000 or more in 1900.
- ⁷ From 1900 to 1910 all deaths were charged to the boroughs in which they occurred; beginning with 1911, deaths were distributed to boroughs of residence.
- ⁸ Transcripts for deaths not received.

Every state has a rate of 40 or more. Those showing the highest rates are South Carolina (189.3), Utah (180.2), Mississippi (168.5), and Virginia (168.2). The lowest rate is shown for New York (67.3). Among the cities of 100,000 population or more in 1910, all but four—Grand Rapids, St. Louis, Rochester, and Syracuse—have rates of 40 or more. All show decreases for the rate in 1919, as compared with the rate for 1918. It is of interest to note that Grand Rapids has the lowest rate for both years.

ENCEPHALITIS LETHARGICA.

The following table shows that encephalitis lethargica was returned as a cause of death in 31 of the 33 states in the registration area and in 8 of the 18 registration cities in nonregistration states in 1919.